

**The Claims**

What is claimed is:

- 1        1.        A corner-cube reflector having three reflective surfaces comprising:  
2                at least one of said reflective surfaces being a surface of a bimaterial cantilever that  
3        changes between a substantially planar shape and a curved shape upon exposure to an agent of  
4        interest.
  
- 1        2.        The apparatus of claim 1 wherein said bimaterial cantilever is chosen from the bimaterial  
2        group of Au-Si, Pd-Si, Au-Si<sub>3</sub>N<sub>4</sub>, and Pd-Si<sub>3</sub>N<sub>4</sub>.
  
- 1        3.        The apparatus of claim 1 wherein an agent sensitive coating is disposed on a surface of  
2        said bimaterial cantilever, said agent sensitive coating being substantially transparent to said  
3        electromagnetic radiation.
  
- 1        4.        The apparatus of claim 1 wherein an agent sensitive coating is disposed on a surface of  
2        said bimaterial cantilever, said agent sensitive coating being substantially reflective of said  
3        electromagnetic radiation.
  
- 1        5.        An apparatus comprising:

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2 a reflector having three reflective surfaces that are mutually orthogonal when said  
3 reflector is in a first condition, wherein at least one of said reflective surfaces is a surface of a  
4 bimaterial cantilever that goes from a substantially planar shape when said reflector is in said  
5 first condition to a curved shape when said reflector is in a second condition;

6 a source of electromagnetic radiation for projecting said electromagnetic radiation to said  
7 reflector; and

8 a detector disposed to receive electromagnetic radiation as reflected from said reflector.

1 6. The apparatus of claim 5 wherein said bimaterial cantilever is chosen from the bimaterial  
2 group of Au-Si, Pd-Si, Au-Si<sub>3</sub>N<sub>4</sub>, and Pd-Si<sub>3</sub>N<sub>4</sub>.

1 7. The apparatus of claim 5 wherein an agent sensitive coating is disposed on a surface of  
2 said bimaterial cantilever, said agent sensitive coating being substantially transparent to said  
3 electromagnetic radiation.

1 8. The apparatus of claim 5 wherein an agent sensitive coating is disposed on a surface of  
2 said bimaterial cantilever, said agent sensitive coating being substantially reflective of said  
3 electromagnetic radiation.

1 9. The apparatus of claim 5 wherein said detector detects the intensity of electromagnetic  
2 radiation as received at said detector.

1 10. The apparatus of claim 5 wherein said detector detects the phase of electromagnetic  
2 radiation as received at said detector.

1 11. The apparatus of claim 5 wherein said detector detects the angle of said electromagnetic  
2 radiation as received at said detector.

1 12. A sensor comprising:  
2 a corner cube reflector having three reflective surfaces that are mutually orthogonal in a  
3 first sensing condition, wherein at least one of said reflective surfaces is a surface of a bimaterial  
4 cantilever that goes from a substantially planar shape when said corner cube reflector is in said  
5 first sensing condition to a curved shape when said corner cube reflector is in a second sensing  
6 condition;

7 a source of electromagnetic radiation for projecting said electromagnetic radiation to said  
8 corner cube reflector; and

9 a detector disposed to receive electromagnetic radiation as reflected from said corner-  
10 cube reflector, said received electromagnetic radiation having of a first state corresponding to  
11 said first sensing condition of said corner cube reflector and having of a second state different  
12 from said first state and corresponding to said second sensing condition of said corner cube.

1 13. The apparatus of claim 12 wherein said bimaterial cantilever is chosen from the

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bimaterial group of Au-Si, Pd-Si, Au-Si<sub>3</sub>N<sub>4</sub>, and Pd-Si<sub>3</sub>N<sub>4</sub>.

14. The apparatus of claim 12 wherein an agent sensitive coating is disposed on a surface of said bimaterial cantilever, said agent sensitive coating being substantially transparent to said electromagnetic radiation.

15. The apparatus of claim 12 wherein an agent sensitive coating is disposed on a surface of said bimaterial cantilever, said agent sensitive coating being substantially reflective of said electromagnetic radiation.

16. A sensing method comprising the steps of:  
providing a corner cube reflector having three reflective surfaces that are mutually orthogonal in a first sensing condition, wherein at least one of said reflective surfaces is a surface of a bimaterial cantilever that goes from a substantially planar shape when said corner cube reflector is in said first sensing condition to a curved shape when said corner cube reflector is in a second sensing condition;

providing a source of electromagnetic radiation for projecting electromagnetic radiation to said corner-cube reflector; and

providing a detector disposed to receive electromagnetic radiation as reflected from said corner-cube reflector, wherein said received electromagnetic radiation has a first state corresponding to said first sensing condition of said corner cube reflector and has a second state

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12 different from said first state and corresponding to said second sensing condition of said corner  
13 cube.

1 17. The method of claim 16 further comprising the step of coating a surface of said bimaterial  
2 cantilever with an agent sensitive coating that is substantially transparent to said electromagnetic  
3 radiation.

1 18. The apparatus of claim 16 wherein an agent sensitive coating is disposed on a surface of  
2 said bimaterial cantilever, said agent sensitive coating being substantially reflective of said  
3 electromagnetic radiation.